

Serial Number 09/548,910

PATENT

IBM Docket No. RAL9-00-0014

Amendments to the Specification:

Amend page 2, paragraph beginning at line 21, as follows:

A1

Patent application S.N. 09/548,907 (~~tba - Docket RAL9-00-0010~~) filed concurrently by Brian M. Bass et al. and entitled "Method and System for Network Processor Scheduler". This patent is sometimes referred to herein as the Scheduler Structure Patent.

Amend page 2, paragraph beginning at line 24, as follows:

A2

Patent application S.N. 09/548,911 (~~tba - Docket RAL9-00-0015~~) filed concurrently by Brian M. Bass et al. and entitled "Method and System for Network Processor Scheduling Based on Calculation". This patent is sometimes referred to herein as the Calculation Patent.

Amend page 3, paragraph beginning at line 1, as follows:

A3

Patent application S.N. 09/834,141 (~~tba - Docket RAL9-00-0016~~) filed concurrently by Brian M. Bass et al. and entitled "Method and System for Network Processor Scheduling Based on Service Levels". This patent is sometimes referred to herein as the Service Level Patent.

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Amend page 3, paragraph beginning at line 5, as follows:

A4

Patent application S.N. 09/548,912 (~~iba Docket RAL9-00-0017~~) filed concurrently by Brian M. Bass et al. and entitled "Method and System for Network Processor Scheduling Outputs Using Queueing". This patent is sometimes referred to herein as the Queueing Patent.

Amend page 3, paragraph beginning at line 9, as follows:

A5

Patent application S.N. 09/548,913 (~~iba Docket RAL9-00-0018~~) filed concurrently by Brian M. Bass et al. and entitled "Method and ~~System~~ System for Network Processor Scheduling Outputs using Disconnect/Reconnect Flow Queues". This patent is sometimes referred to herein as the Reconnection Patent.

Amend page 3, paragraph beginning at line 13, as follows:

A6

Patent application S.N. 09/546,651 (~~iba Docket RAL9-00-0007~~) filed April 10, 2000 by Brian M. Bass et al. and entitled "Method and System for Minimizing Congestion in a Network". This patent is sometimes referred to herein as the Flow Control Patent.

Amend page 3, paragraph beginning at line 16, as follows:

A7

Patent application S.N. 09/547,280 (~~iba Docket RAL9-00-0004~~) filed April 11, 2000 and entitled "Unified Method and System for Scheduling and Discarding Packets in Computer Networks". This patent is sometimes referred to herein as the Packet Discard Patent.

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Amend page 7, paragraph beginning at line 3, as follows:

A8
Some prior art systems handle outgoing information units from a processing system in a variety of ways. One suggestion is to use a round robin scheduler with which fairness amongst a set of queues. Another one employs several different levels of priorities and a queue for each. In such a system, you have an absolute priority where the highest priority work is processed first and the lowest priority work may never get serviced. Still another method of scheduling outputs involves a plurality of prioritized lists. It is also known to use a hierarchical packet scheduling system. There are even systems which use several different scheduling methods in determining the order in which information units are to be sent toward a data transmission network, using a combination of different scheduling techniques.

Amend page 9, paragraph beginning at line 6, as follows:

A9
The present invention overcomes the disadvantages and limitations of the prior art systems by providing a simple, yet effective, way of handling information units or frames coming out of a processing system and directing frames to output ports for dispatch to a an data transmission network. The present invention has particular application to a system in which packets of variable length are being handled from a plurality of users and where a level of service commitment has been made to at least some of the users.

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Amend page 14, paragraph beginning at line 3, as follows:

A10

The arrows show the general flow of data within the interface system shown in Fig. 1. Frames of data or messages (also sometimes referred to as packets or information units) received from an Ethernet MAC 14 off the ENET PHY block 38 via the DMU bus are placed in internal data store buffers 16a by the EDS-UP device 16. The frames may be identified as either normal frames or guided frames, which then relates to method and location of the subsequent processing in the plurality of processors. After the input units or frames are processed by one of the plurality of processors in the embedded processor complex, the completed information units are sent to the switch to be delivered to an ingress ~~egress~~ side of a network processor. Once the information units are received on the ingress side of the network processor, they are processed by one of the plurality of processors in the embedded processor complex, and when the egress processing is completed, they are scheduled through the scheduler 40 out of the processing unit 10 and onto the data transmission network through the PMM-DN multiplexed MAC's 36 and the physical layer 38.

Amend page 14, paragraph beginning at line 17, as follows:

A11

Fig. 2 is a block diagram of a processing system 100 which can employ the present invention to advantage. In this Fig. 2, a plurality of processing units 110 are located between a dispatcher unit 112 and a completion unit ~~114~~ 120. Each egress frame F (from a switch, not shown, attached to the present data processing system) is received and stored into a DOWN data store (or DN DS) 116, then sequentially removed by the dispatcher 112 and assigned to one of the plurality of processing units 110, based on a

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determination by the dispatcher 112 that the processing unit is available to process the frame. Greater detail on the structure and function of the processing units 110 in particular, and the processing system in general, can be found in the NPU Patent references above and patent applications and descriptions of the individual components such as a flow control device detailed in the Flow Control Patent. Interposed between the dispatcher 112 and the plurality of processing units 110 is a hardware classifier assist 118 which is described in more detail in a pending patent application S. N. 09/479,027 filed January 7, 2000 by J. L. Calvignac et al. and assigned to the assignee of the present invention, an application which is incorporated herein by reference. The frames which are processed by the plurality of network processors 110 go into a completion unit 120 which is coupled to the DN Enqueue 34 through a flow control system as described in the Flow Control Patent and the Packet Discard Patent. The DN Enqueue 34 is coupled through the PMM DN MAC's 36, then by the DMU data bus to the physical layer 38 (the data transmission network itself).

Amend page 16, paragraph beginning at line 1, as follows:

A12

In the above mentioned calendars, pointers are used to represent a flow queue's location within the calendar. Further there may be none, one, or two such pointers to a single flow queue present in the plurality of calendars in the system. Typically, pointers in a calendar do not represent un-initialized or empty flow queues. When a pointer to a flow queue is present in a calendar in the system, the flow queue may be referred to as being "in" the calendar.
